UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,226	10/14/2003	Gil M. Vardi	1599.003US2	4628

21186 7590 04/17/2006

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
IMAM, ALI M	
ART UNIT	**PAPER NUMBER**
3737	

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Schwegman, Lundberg,
Woessner & Kluth, P.A.
APR 2 0 2006
RECEIVED

Advisory Action Before the Filing of an Appeal Brief	**Application No.** *10/685,226*	**Applicant(s)** VARDI ET AL.
	Examiner Ali Imam	**Art Unit** 3737

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 17 March 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires ______months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: *See Continuation Sheet*. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *1-19 and 21-52*.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☒ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). 1/30/06
13. ☐ Other: _____.

Ali Imam
Primary Examiner
Art Unit: 3737

Continuation of 3. NOTE: "separate ancillary device" raises new issue which requires further search .

Continuation of 11. does NOT place the application in condition for allowance because: Applicant's core argument is that Riza does not teach an imaging device that goes inside a body wherein the imaging device includes an elongated body comprising an acoustic-to-optical transducer and wherein the elongated body is sufficiently small in diameter and sufficiently rigid to permit sue for introducing an ancillary device into the body. The examiner respectfully disagrees. Riza imaging probe is a fiber optic based ultrasonic imaging device that goes inside the body (col. 1, lines 5-6) which inherently includes an elongated body. It is further inherent for Riza's elongate member which houses the acoustic-to-optical transducer (37) with fiber Bragg grating tip (see claim 25 of Riza) to be sufficiently small diameter and sufficient rigidity to permit use of introducing the ultrasonic transmit probing (the ancillary device/catheter) and the ultrasonic receive probing (e.g. imaging) (see col. 1, lines 5-7) into the body. Applicant's arguments with respect to the dependent claims are fully considered but they not persuasive in that the limitations of the dependent claims are either inherent or well known in the imaging art.

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

OIPE IAP46
JAN 30 2006
PATENT & TRADEMARK OFFICE

Sheet 1 of 1

Complete if Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3737
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
	US-5,684,297	11/04/1997	Tardy, A. , et al.	11/15/1995

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
		"European Search Report for corresponding European Application No. EP 05 02 4287", (Attorney Docket No. 1599.003EP2),(December 16, 2005), 3 pgs.	

EXAMINER **DATE CONSIDERED** 4/13/6

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,226	10/14/2003	Gil M. Vardi	1599.003US2	4628

21186 7590 01/13/2006

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH
1600 TCF TOWER
121 SOUTH EIGHT STREET
MINNEAPOLIS, MN 55402

EXAMINER	
IMAM, ALI M	

ART UNIT	PAPER NUMBER
3737	

T_SLW08391

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Schwegman, Lundberg, Woessner & Kluth, P.A.
JAN 17 2006
RECEIVED

PORTFOLIO IP
JAN 17 2006
RECEIVED

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/685,226	**Applicant(s)** VARDI ET AL.
	Examiner Ali Imam	**Art Unit** 3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/17/5 (amendment)*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19 and 21-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19 and 21-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *10/17/5*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment filed 10/17/2005, all necessary changes to the claims have been entered.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-19 and 21-52 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,659,957 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application is broader in scope than the claims of the '957 patent.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-19 and 21-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Riza (US 5,718,226).

Riza teaches in cols. 3-10, an imaging device adapted to be inserted into a body cavity for imaging a portion of the body (col. 5, line 50) comprising inherently an elongated member including proximal end and distal end; and an acoustic-to-optical transducer (37) located on the elongate member away from the proximal end of the elongate member. Riza further teaches optical fiber (12), Bragg grating sensor (col. 6, line 16), and PZT transducer. The specific limitations of the guidewire and dimensions of the elongated probe are well known in the art of ultrasonic imaging device that goes inside the body. The amended limitation which includes the limitation of previously rejected claim 20 does not add any patentability to the pending claims. It is inherent for Riza's elongate member which houses the acoustic-to-optical transducer (37) with fiber Bragg grating tip (see claim 25 of Riza) to be sufficiently small diameter and sufficient rigidity to permit use of introducing the ultrasonic transmit probing (the ancillary device/catheter) and the ultrasonic receive probing (e.g. imaging) (see col. 1, lines 5-7) into the body.

Response to Arguments

6. Applicant's arguments filed 10/17/2005 have been fully considered but they are not persuasive. Applicant's core argument is that Riza does not teach an imaging device that goes inside a body wherein the imaging device includes an elongated body comprising an acoustic-to-optical transducer and wherein the elongated body is sufficiently small in diameter and sufficiently rigid to permit sue for introducing an ancillary device into the body. The examiner respectfully disagrees. Riza imaging probe is a fiber optic based ultrasonic imaging device that

goes inside the body (col. 1, lines 5-6) which inherently includes an elongated body. It is further inherent for Riza's elongate member which houses the acoustic-to-optical transducer (37) with fiber Bragg grating tip (see claim 25 of Riza) to be sufficiently small diameter and sufficient rigidity to permit use of introducing the ultrasonic transmit probing (the ancillary device/catheter) and the ultrasonic receive probing (e.g. imaging) (see col. 1, lines 5-7) into the body. Applicant's arguments with respect to the dependent claims are fully considered but they not persuasive in that the limitations of the dependent claims are either inherent or well known in the imaging art.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ali Imam whose telephone number is 571-272-4737. The examiner can normally be reached on Mon. - Th., 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ali Imam
Primary Examiner
Art Unit 3737

AI
1/9/6

PTO/SB/08A (10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

O I P E
OCT 17 2005
IAP65
PATENT & TRADEMARK OFFICE

Complete if Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3737
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
A.I.	US-2005-0131289A1	06/16/2005	Aharoni, Abraham , et al.	01/08/2002

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T²
A.I.	CA-2472877	07/17/2003	Sturlesi, Gideon E., et al.	
A.I.	WO-2004090484	10/21/2004	Aharoni, Rami, et al.	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²

EXAMINER Ali Imam DATE CONSIDERED 1/9/6

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

4_A_T_13005

OARN

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,226	10/14/2003	Gil M. Vardi	1599.003US2	4628

21186 7590 01/18/2007
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
JAWORSKI, FRANCIS J	
ART UNIT	**PAPER NUMBER**
3768	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

INTELLEVATE
JAN 22 2007
RECEIVED
Coded AB Verified

Schwegman Lundberg
Woessner & Kluth P.A.
JAN 22 2007
RECEIVED

## *Office Action Summary*	**Application No.** 10/685,226	**Applicant(s)** VARDI ET AL
	Examiner Jaworski Francis J.	**Art Unit** 3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2006*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19 and 21-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,21-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 – 19 and 21 - 52 as currently are rejected under 35 U.S.C. 103(a) as obvious based upon Riza et al (US5718226, of record), in view of any one of Sinofsky et al (cited above), Benett et al (US5944687 parent of US6379325 cited in the 5/9/05 IDS) or O'Donnell et al (US5615675), and further in view of Morey et al (US5007705, newly of record).

The former as noted pertains to a photoacoustic ultrasonic array positioned distally on an intracavitary probe as characterized in the previous office action and selectively swept for beamforming in a direction longitudinal with respect to the array. Whereas Riza does not teach operation with an ancillary separate device, it would have been obvious in view of Sinofsky et al col. 2 lines 57 – 59 to construct and operate an acousto-optical imaging catheter such that a separate ancillary device in the form of a guide wire may be used to place the catheter into the vasculature, or in view of Benett et al which is similarly directed to catheter-based intravascular imaging using a acoustooptical transducer on receive to additionally operate the catheter as a multi-lumen device with ancillary lavage or locator or imaging devices as per col. 7 lines 6 – 15. Finally, whereas the Riza et al imaging system does not discuss the introduction of separate devices, it would have been obvious in view of O'Donnell et al which teaches Bragg cell acousto-optical receive imaging to also associate the probe-like microscopy device with a biopsy needle structure so that when inside the body the device can serve to directly sample the tissue whose pathology is being imaged.

Accordingly the prior Office action rejection involving Riza had revised to present the additional teachings in the art for teaming an acousto-optical imaging catheter with separate ancillary (related) devices for completing a diagnostic and/or therapeutic regimen.

Additionally, Morey et al makes clear in col. 2 lines 34 – 57 that longitudinally distributed element fiber Bragg grating probes were well-known in the art for acousto-optically sensing ultrasound information along the probe length since the differential spacing was necessary for the full characterization of the impinging ultrasound signals.

This action is NOT made final however the case should be prepared for final action.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

01072007

Francis J. Jaworski
Primary Examiner

Notice of References Cited	Application/Control No. 10/685,226	Applicant(s)/Patent Under Reexamination VARDI ET AL
	Examiner Jaworski Francis J.	Art Unit 3768 · Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,007,705	04-1991	Morey et al.	385/12
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

UNITED STATES PATENT AND TRADEMARK OFFICE

T_SLW05818

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,226	10/14/2003	Gil M. Vardi	1599.003US2	4628

21186 7590 06/15/2005

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402-0938

EXAMINER	
IMAM, ALI M	
ART UNIT	**PAPER NUMBER**
3737	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PORTFOLIO I.P.
JUN 20 2005
RECEIVED

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/685,226	VARDI ET AL.
	Examiner	**Art Unit**
	Ali Imam	3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/623,248.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/9/5;10/14/3*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-47 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,659,957 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application is broader in scope than the claims of the '957 patent.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Riza (US 5,718,226).

Riza teaches in cols. 3-10, an imaging device adapted to be inserted into a body cavity for imaging a portion of the body (col. 5, line 50) comprising inherently an elongated member including proximal end and distal end; and an acoustic-to-optical transducer (37) located on the elongate member away from the proximal end of the elongate member. Riza further teaches optical fiber (12), Bragg grating sensor (col. 6, line 16), and PZT transducer. The specific limitations of the guidewire and dimensions of the elongated probe are well known in the art imaging device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ali Imam whose telephone number is 571-272-4737. The examiner can normally be reached on Mon. - Th., 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ali Imam
Primary Examiner
Art Unit 3737

AI
6/11/5

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

OIPE
MAY 09 2005
PATENT & TRADEMARK OFFICE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 5

Complete if Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3762
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
A.I.	US-2001/0021843 A1	09/13/2001	Bosselmann, Thomas , et al.	03/13/2001
	US-2002/0039463 A1	04/04/2002	Degertekin, Fahrettin L., et al.	06/28/2001
	US-2002/0041735 A1	04/11/2002	Cai, Y. , et al.	09/06/2001
	US-2003/0187369 A1	10/02/2003	Lewis, Stephen B., et al.	03/28/2002
	US-4,473,065	09/25/1984	Bates, Kenneth N.	04/06/1982
	US-4,522,193	06/11/1985	Bates, Kenneth N.	03/02/1984
	US-4,900,921	02/13/1990	Spillman, Jr., W. B.	09/19/1988
	US-4,917,097	04/17/1990	Proudian, Andrew P., et al.	10/27/1987
	US-5,070,882	12/10/1991	Bui, T. , et al.	08/22/1989
	US-5,099,090	03/24/1992	Allan, G G., et al.	01/11/1990
	US-5,135,486	08/04/1992	Eberle, Michael J., et al.	08/31/1990
	US-5,156,772	10/20/1992	Allan, G G.	05/11/1988
	US-5,167,233	12/01/1992	Eberle, Michael J., et al.	01/07/1991
	US-5,183,048	02/02/1993	Eberle, Michael J.	06/24/1991
	US-5,368,037	11/29/1994	Eberle, Michael J., et al.	02/01/1993
	US-5,453,575	09/26/1995	O'Donnell, Matthew , et al.	04/28/1994
	US-5,486,170	01/23/1996	Winston, T. R., et al.	09/22/1994
	US-5,603,327	02/18/1997	Eberle, Michael J., et al.	08/18/1995
	US-5,615,675	04/01/1997	O'Donnell, Matthew , et al.	04/19/1996
	US-5,680,489	10/21/1997	Kersey, A. D.	06/28/1996
	US-5,732,046	03/24/1998	O'Donnell, Matthew D., et al.	04/19/1996
	US-5,779,644	07/14/1998	Eberle, Michael J., et al.	09/11/1996
	US-5,830,145	11/03/1998	Tenhoff, Harm	12/24/1996
	US-5,857,974	01/12/1999	Eberle, Michael J., et al.	01/08/1997
	US-5,876,344	03/02/1999	Baker, Bruce A., et al.	12/09/1997
	US-5,921,931	07/13/1999	O'Donnell, Matthew , et al.	04/08/1997
	US-5,938,615	08/17/1999	Eberle, Michael J., et al.	09/23/1997
	US-6,049,958	04/18/2000	Eberle, Michael J., et al.	11/19/1997
	US-6,080,109	06/27/2000	Baker, Bruce A., et al.	01/21/1999
	US-6,100,969	08/08/2000	Perez, Ignacio	12/02/1998
	US-6,123,673	09/26/2000	Eberle, Michael J., et al.	06/02/1999
A.I.	US-6,134,003	10/17/2000	Tearney, Guillermo , et al.	02/27/1996

EXAMINER

DATE CONSIDERED 6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO	*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*	**Application Number**	10/685,226
	Filing Date	October 14, 2003
	First Named Inventor	Vardi, Gil
	Group Art Unit	3762
	Examiner Name	Imam, Ali
Sheet 2 of 5	**Attorney Docket No: 1599.003US2**	

A.I.	US-6,210,339	04/03/2001	Kiepen, Horst F., et al.	03/03/1999
	US-6,283,920	09/04/2001	Eberle, Michael J., et al.	09/08/2000
	US-6,315,732	11/13/2001	Suorsa, Veijo T., et al.	07/20/1999
	US-6,379,325	04/30/2002	Benett, W. , et al.	07/09/1999
	US-6,575,965	06/10/2003	Fitch, J. P., et al.	11/16/2000
	US-6,585,660	07/01/2003	Dorando, Dale G., et al.	05/18/2001
	US-6,618,916	09/16/2003	Eberle, Michael J., et al.	04/17/2000
	US-6,659,957	12/09/2003	Vardi, G. M., et al.	06/11/2002
A.I.	US-6,779,257	08/24/2004	Kiepen, Horst F., et al.	02/20/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T²
A.I.	EP-0478410A1	04/01/1992	Leugers, M. A., et al.	
	EP-1152240A2	11/07/2001	Ogawa, E.	
	GB-2270159A	03/02/1994	Edge, M. G., et al.	
	WO-99/58059A1	11/18/1999	Vardi, G. M., et al.	
	WO-02/19898A2	03/14/2002	Rønnekleiv, E., et al	
	WO-02/054948A1	07/18/2002	Blodgett, D. W., et al.	
	WO-02/075404A1	09/26/2002	Bailey, T. J., et al.	
	WO-03/057061A1	07/17/2003	Aharoni, A., et al.	
	WO-2004/008070A2	01/22/2004	Coter, F.	
	WO-2004/029667A2	04/08/2004	Grunberg, I., et al.	
	WO-2004/032746A2	04/22/2004	Bates, K. N., et al.	
A.I.	WO-2004/077100A2	09/10/2004	Khachaturove, A., et al.	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
A.I.		"Tissue Characterization through Ultrasonic Backscatter", http://www.brl.uiuc.edu/Projects/backscatter.htm, (Observed on September 25, 2002), 5 pgs.	
		BATES, K. N., "A High Acuity 3D Acoustic Imaging System", Proceedings., 1995 IEEE Ultrasonics Symposium, 2, (November 7-10, 1995),1245-1250	
		BATES, K. N., "A One Dimensional Phased Array Imaging System", Ph.D. Dissertation, Applied Physics, Standford University, (1982),	
		BATES, KENNETH N., et al., "Digitally Controlled Electronically Scanned and Focused Ultrasonic Imaging System", IEEE Ultrasonics Symposium Proceedings, 1979, (September 26-28, 1979), 216-220	
A.I.		BATES, K. N., et al., "PEOATS and ESOATS", IEEE Ultrasonics Symposium Proceedings, 1979, (September 26-28, 1979), 189-194	

EXAMINER	Ali Imam	DATE CONSIDERED	6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional) ² Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 3 of 5

Complete if Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3762
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
A.I.		BATES, K. N., "Tolerance Analysis for Phased Arrays", *In: Acoustic Imaging*, 9, (1980), 239-262	
		BUMA, T., et al., "A High Frequency Ultrasound Array Element Using Thermoelastic Expansion in PDMS", Proceedings of the 2001 IEEE Ultrasonics Symposium, 2(2), (October 7-10, 2001), 1143-1146	
		BUMA, T., et al., "A High-Frequency, 2-D Array Element Using Thermoelastic Expansion in PDMS", IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, 50(9), (September 2003), 1161-1176	
		BUMA, T. , et al., "High Frequency Ultrasonic Imaging Using Optoacoustic Arrays", Proceedings of the Proceeding of the 2002 IEEE Ultrasonics Symposium, 1, Invited paper, (October 8-11, 2002), 571-580	
		BUMA, T., et al., "High Frequency Ultrasound Array Element using Thermoelastic Expansion in an Elastomeric Film", Applied Physics Letters, 79(4), (July 23, 2001), 548-550	
		BUMA, T., et al., "High-frequency ultrasound imaging using opto-acoustic arrays", Proceedings of the SPIE - The International Society for Optical Engineering, 4687, (2002), 99-109	
		BUMA, T., et al., "Thermoelastic Expansion versus Piezoelectricity for High Frequency 2-D Arrays", IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, 50(8), (August 2003), 1065-1068	
		BUMA, T. , et al., "Thermoelastic Generation of Continuous Lamb Waves for Microfluidic Devices", Proceeding of the 2003 IEEE Ultrasonics Symposium, (2003), 150-153	
		BUMA, T. , et al., "Thermoelastic Generation of Ultrasound Using an Erbium Doped Fiber Amplifier", Proceeding of the 1999 IEEE Ultrasonics Symposium, 2, (October 17-20, 1999), 1253-1256	
		HAMILTON, J. D., et al., "An Active Optical Detector for High Frequency Ultrasound Imaging", Proceedings of the 1997 IEEE Ultrasonics Symposium, 1, (October 5-8, 1997), 753-756	
		HAMILTON, J. D., et al., "High Frequency Optoacoustic Arrays Using Etalon Detection", IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, 47(1), (January 2000), 160-169	
		HAMILTON, J. D., et al., "High Frequency Ultrasound Imaging Using an Active Optical Detector", IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control UFFC-45, (1998), 719-727	
		HAMILTON, J. D., et al., "High Frequency Ultrasound Imaging with Optical Arrays", IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, 45(1), (January 1998), 216-235	
A.I.		HAMILTON, J. D., et al., "Optical Arrays for High Frequency Ultrasound Imaging", Proceedings of the 1996 *IEEE Ultrasonics* Symposium, (1996), 1419-1422	

EXAMINER	**DATE CONSIDERED** 6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional) ² Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office. U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 4 of 5

Complete If Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3762
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
A.I.		KARL, W. C., "Multi-Sensor Fusion for Atherosclerotic Plaque Characterization", Boston Univ - MDSP, 15 pages, (obtained from the internet on 9/25/2002, http://www.censsis.neu/Education/StudentResearch/2001/posters/weisensell)rl.pdf,	
		KOMIYAMA, N., et al., "Tissue Characterization of Atherosclerotic Plaques by Intravascular Ultrasound Radiofrequency Signal Analysis: An In Vitro Study of Human Coronary Arteries", Entrez-PubMed - (http://www.ncbi.nlm.nih.gov/entrez/query) (Oberved on September 25, 2002), 2 pgs.	
		KRASS, S., et al., "P3.4 Pattern Reconition Algorithms for Tissue Characterisation in Intracoronary Ultrasound Imaging: Test Data Set and Results of Computerised Texture Analysis", 2nd Medical Clinic, Univ-Mainz, Germany - (http://www.uni-mainz.de/Cardio/incis/Data/p3_4.htm), (Observed on September 25, 2002), 3 pgs.	
		MINTZ, GARY S., et al., "American College of Cardiology Clenical Expert Consensus Document on Standards for Acquisition, Measurement and Reporting of Intravascular Ultrasound Studies (IVUS)", Journal of the American College of Cardiology, 37(5), (April 2001), 1478-1492	
		O'DONNELL, M., "New Imaging Technologies for Ultrasonography", J Med Ultrasonics, 27(4), (2000), Presented at the 73rd Japan Society of Ultrasound in Medicine Meeting, Invited Paper, 356-357	
		O'DONNELL, M. , et al., "Optoacoustics: high frequency ultrasonic array imaging", Proceedings of 17th International Congress on Acoustics, Vol. IV, Biomedicine, Acoustics in Medicine, Invited Presentation at the 17th Intl Congress on Acoustics, Rome,(September 2-7, 2001),2-3	
		OTHONOS, A. , et al., "In Section 7.9 Bragg Gating Fiber Laser Sensors from Fiber Bragg Gratings: fundamentals and applications in telecommunications and sensing", (1999 Artech House, Inc.), 355-367	
		PEPINE, CARL J., et al., "Improving Diagnostic and Therapeutic Outcomes Through Advanced Intravascular Imaging", Vascular Technologies, Inc., (1989),	
		SCULLY, P. J., "UV Laser Photo-induced Refractive Index Changes in Poly-Methyl-Meth-Acrylate and Plastic Optical Fibres for Application as Sensors and Devices", Central Laser Facility Annual Report, 1999/2000, (1999-2000),145-147	
		SPISAR, M. , et al., "Stabilized, Resonant Optoacoustic Array Detectors for Medical Imaging", Proceedings of the World Congress on Ultrasonics, Paris, France,(Sep 7-10, 2003),25-28	
A.I.		STEFANADIS, CHRISTODOULOS , et al., "Identification and Stabilization of Vulnerable Atherosclerotic Plaques: The Role of Coronary Thermagraphy and External Heat Delivery", Identification and Stabilization of Vulnerable Atherosclerotic Plaques IHJ - http://www.indianheartjournal.org, (2001), (Observed on September 25), 2002, 10 pgs.	

EXAMINER Ali Imam **DATE CONSIDERED** 6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 5 of 5

Complete If Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3762
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
A.I.		SUROWIEC, J., et al., "A Novel Miniature Optical Fibre Probe for MHz Frequency Ultrasound", Ultrasonics Symposium, IEEE, ISBN: 0-7803-3615-1, (Nov. 3, 1996),1051-1054	
A.I.		WAHLE, ANDREAS , et al., "Accurate Visualization and Quantification of Coronary Vasculature by 3-D/4-D Fusion from Biplane Angiography and Intravascular Ultrasound", In: Biomonitoring and Endoscopy Technologies; I. Gannot et al., eds, (July 5-6, 2000),144-155	

EXAMINER Ali Imam DATE CONSIDERED 6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional) ² Applicant is to place a check mark here if English language Translation is attached

10/14/2003

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office. U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known

Application Number	Unknown
Filing Date	Even Date Herewith
First Named Inventor	Vardi, Gil
Group Art Unit	Unknown
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-5,095,911	03/17/1992	Pomeranz, Mark L.	128	662.06	05/18/1990
	US-5,186,177	02/16/1993	O'Donnell, Matthew , et al.	128	662.06	12/05/1991
	US-5,226,847	07/13/1993	Thomas III, Lewis J., et al.	128	662.06	01/31/1992
	US-5,240,004	08/31/1993	Walinsky, Paul , et al.	128	662.06	02/14/1992
	US-5,290,275	03/01/1994	Kittrell, Carter , et al.	606	15	07/16/1991
	US-5,305,758	04/26/1994	Dietz, Dennis R., et al.	128	662.06	12/02/1992
	US-5,383,467	01/24/1995	Auer, Michael L., et al.	128	664	11/18/1992
	US-5,400,788	03/28/1995	Dias, J. F., et al.	128	662.03	06/07/1993
	US-5,427,107	06/27/1995	Milo, Charles , et al.	128	662.06	12/07/1993
	US-5,439,000	08/08/1995	Gunderson, Richard C., et al.	128	664	11/18/1993
	US-5,582,171	12/10/1996	Chornenky, Victor , et al.	128	653.1	07/08/1994
	US-5,601,087	02/11/1997	Gunderson, R. C., et al.	128	664	06/07/1995
	US-5,660,180	08/26/1997	Malinowski, Igor , et al.	128	660.03	05/28/1996
	US-5,675,674	10/07/1997	Weis, R S.	385	12	08/24/1995
	US-5,682,897	11/04/1997	Pomeranz, Mark L.	128	662.06	09/12/1996
	US-5,779,643	07/14/1998	Lum, Paul , et al.	600	462	11/26/1996
	US-5,852,233	12/22/1998	Arnold, Walter , et al.	73	105	07/02/1997
	US-5,865,178	02/02/1999	Yock, Paul G.	128	660.03	06/06/1995
	US-5,872,879	02/16/1999	Hamm, Mark A.	385	25	11/25/1996
	US-5,894,531	04/13/1999	Alcoz, Jorge J.	385	11	03/11/1997
	US-5,938,609	08/17/1999	Pomeranz, Mark L.	600	439	08/01/1997
	US-6,039,701	03/21/2000	Sliwa, Jack , et al.	600	588	09/05/1996
	US-6,057,927	05/02/2000	Levesque, Daniel , et al.	356	432 T	02/25/1998
	US-6,078,831	06/20/2000	Belef, William M., et al.	600	424	09/29/1997
	US-6,111,645	08/29/2000	Tearney, Guillermo , et al.	356	354	05/15/1998
	US-6,228,078	05/08/2001	Eggers, Philip E., et al.	606	32	11/25/1997
	US-6,238,347	05/29/2001	Nix, Elvin L., et al.	600	463	09/30/1997
	US-6,248,076	06/19/2001	White, David A., et al.	600	463	07/25/2000
	US-6,261,246	07/17/2001	Pantages, Anthony J., et al.	600	585	09/28/1998
	US-6,282,011	08/28/2001	Tearney, Guillermo , et al.	359	287	06/26/2000
	US-6,306,096	10/23/2001	Seward, James B., et al.	600	463	06/02/2000
	US-6,421,164	07/16/2002	Tearney, Guillermo , et al.	359	287	06/13/2001

EXAMINER Ali Imam DATE CONSIDERED 6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known

Application Number	Unknown
Filing Date	Even Date Herewith
First Named Inventor	Vardi, Gil
Group Art Unit	Unknown
Examiner Name	Imam, Ali

Attorney Docket No: 1599.003US2

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T²
A.I.	WO-01/21244	03/29/2001	Davidson, Charles J., et al.	A61 M	25/10	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
A.I.		BLOTEKJAER, K. , "Theoretical concepts of a novel Vernier-based fringe-counting fibre optic sensor", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),126-129	
		BRADY, G. P., et al., "Simultaneous measurement of strain and temperature using the first- and second-order diffraction wavelengths of Bragg gratings", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),156-161	
		DAVIS, M. A., et al., "Simultaneous measurement of temperature and strain using fibre Bragg gratings and Brillouin scattering", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),151-155	
		FECED, R. , et al., "Advances in high resolution distributed temperature sensing using the time-correlated single photon counting technique", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),183-188	
		FURSTENAU, N. , et al., "Extrinsic Fabry-Perot interferometer vibration and accoustic sensor systems for airport ground traffic monitoring", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),134-144	
		LOCKEY, R. A., et al., "Multicomponent time-division-multiplexed optical fibre laser Doppler anemometry", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),168-175	
		MACPHERSON, W. N., et al., "Phase demodulation in optical fibre Fabry-Perot sensors with inexact phase steps", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),130-133	
		MCCULLOCH, S. , et al., "Development of a fibre optic micro-optrode for intracellular pH measurements", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),162-167	
		TANAKA, S. , et al., "Fibre optic spectral polarimetry for sensing multiple stress-loaded locations along a length of fibre", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),176-182	
A.I.		YOSHINO, T. , et al., "Spiral fibre microbend sensors", IEE Proceedings, Optoelectronics, 144, 3, (June 1997),145-150	

EXAMINER Ali Imam DATE CONSIDERED 6/11/5

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional) ² Applicant is to place a check mark here if English language Translation is attached

Notice of References Cited	Application/Control No. 10/685,226	Applicant(s)/Patent Under Reexamination VARDI ET AL.
	Examiner Ali Imam	Art Unit 3737 / Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	*Classification*
	A	US-5,718,226 A	02-1998	Riza, Nabeel A.	600/437
	B	US-6,659,957 B1	12-2003	Vardi et al.	600/467
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

T_SLW10763

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,226	10/14/2003	Gil M. Vardi	1599.003US2	4628

21186 7590 07/24/2006

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER	
JAWORSKI, FRANCIS J	
ART UNIT	**PAPER NUMBER**
3768	

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

INTELLEVATE
JUL 27 2006
RECEIVED
Coded_____ Verified_____

Schwegman, Lundberg, Woessner & Kluth, P.A.
JUL 27 2006
RECEIVED

Office Action Summary	**Application No.** 10/685,226	**Applicant(s)** VARDI ET AL.	
	Examiner Jaworski Francis J.	**Art Unit** 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2006 Amdt*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19, 21 - 52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19 and 21-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/30/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The Information Disclosure Statement filed on January 30, 2006 stated that the European Search Report for the corresponding EP 05 02 4287 application had been included in the submission however the Examiner has been unable to locate same in our Image File Wrapper records.

Claims 1 – 19 and 21 – 52 are present for examination in this case; claim 20 has been cancelled.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 – 19 and 21 - 52 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No. 6659957, further in view of Sinofsky et al (US5254112).

Although the conflicting claims are not identical, they are not patentably distinct from each other because while the '957 patent claims details of an elongated Bragg Diffraction-based acousto-optic transducer for vascular imaging but does not claim a small diameter internal imager (that is, one which images from within the body) such as a catheter-based internal imager, and does not directly claim 'sufficient rigidity to permit use for introducing a separate ancillary device into the body..' However in the case of the latter feature the patent base claim includes claiming of a strengthening member, and later claims 10-15 present the feature of a lens type filler introduced into recesses in the latter. Therefore it may be argued that the patent also claims an elongated device with sufficient rigidity to support an ancillary polymer-based lens device which is separate from the acousto-optical transducer proper, i.e. the fiber plus piezoelectric cladding.

Whereas the patent claims fall short of claiming a small diameter internal catheter adaptation for such acousto-optical imaging, it would have been obvious in view of Sinofsky et al cols. 5 – 6 bridging to adapt the claimed invention of Vardi et al – '957 to a small diameter embodiment, since the latter teaches that where an optical fiber or fibers are the signal emissaries into the vasculature system for receiving acousto-optical (back conversion of echoes) from an ultrasonic device , a narrow diameter catheter is an advantageous delivery device because it allows the imaged vessel wall site to be subjected to angioplasty treatment.

Accordingly an obvious-type double-patenting rejection is argued to be proper here.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 – 9 and 21 - 52 as amended are rejected under 35 U.S.C. 103(a) as obvious based upon Riza et al (US5718226, of record), in view of any one of Sinofsky et al (cited above), Benett et al (US5944687 parent of US6379325 cited in the 5/9/05 IDS) or O'Donnell et al (US5615675).

The former as noted pertains to a photoacoustic ultrasonic array positioned distally on an intracavitary probe as characterized in the previous office action and selectively swept for beamforming in a direction longitudinal with respect to the array. Whereas Riza does not teach operation with an ancillary separate device, it would have been obvious in view of Sinofsky et al col. 2 lines 57 – 59 to construct and operate an acousto-optical imaging catheter such that a separate ancillary device in the form of a guide wire may be used to place the catheter into the vasculature. or in view of Benett et al which is similarly directed to catheter-based intravascular imaging using a acoustooptical transducer on receive to additionally operate the catheter as a multi-lumen device with ancillary lavage or locator or imaging devices as per col. 7 lines 6 – 15. Finally, whereas the Riza et al imaging system does not discuss the introduction of separate devices, it would have been obvious in view of O'Donnell et al which teaches Bragg cell acousto-optical receive imaging to also associate the probe-like microscopy device with a biopsy needle structure so that when inside the body the device can serve to directly sample the tissue whose pathology is being imaged.

Accordingly the prior Office action rejection involving Riza is revised to present the additional teachings in the art for teaming an acousto-optical imaging catheter with separate ancillary (related) devices for completing a diagnostic and/or therapeutic regimen.

Patentability Assessment

While it is implicit from the art rejections that the use of e.g. Bragg cell acousto-optical catheter-based imaging transducers would have been known, and in association with related inserted device structures for accomplishing for example angioplasty-related procedures, base claims amended soas to define a catheter-based acoustooptical imaging system using a continuous Bragg cell pattern at discrete locations distributed longitudinally along the optical core would serve to create patentable subject matter once a Terminal Disclaimer is proffered since the prior art citations of record appears to be confined to lumped acousto-optical device positioning at or near the catheter tip (meaning that the artisans were viewing the acousto-optic transducer approach as a effectively a swapout for a conventional distal catheter end ultrasound imaging array with the advantage of wireless optic fibers for interconnection back along the catheter and thus a slimmer overall profile), devices such as in the genre of Tardy et al (US5684297) identified a regional sensor (pressure, temperature) utility for distributed Bragg cell operation but not an integrated imaging function, and the Examiner's rejection against claim 41 is predicated on an alternative interpretation (transducer operation during beamforming longitudinally across the sweep direction, i.e. a longitudinal- with- respect- to- what based argument).

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

07-17-2006

Primary Examiner
AU 3768

PTO/SB/08A(10-01)
Approved for use through 10/31/2002. OMB 651-0031
US Patent & Trademark Office U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

OIPE
JAN 3 0 2006
PATENT & TRADEMARK OFFICE

Sheet 1 of 1

Complete if Known

Application Number	10/685,226
Filing Date	October 14, 2003
First Named Inventor	Vardi, Gil
Group Art Unit	3737
Examiner Name	Imam, Ali
Attorney Docket No: 1599.003US2	

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
	US-5,684,297	11/04/1997	Tardy, A. , et al.	11/15/1995

OTHER DOCUMENTS – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T 2
		"European Search Report for corresponding European Application No. EP 05 02 4287", (Attorney Docket No. 1599.003EP2),(December 16, 2005), 3 pgs.	

EXAMINER

DATE CONSIDERED 7-17-06

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

## Notice of References Cited	Application/Control No. 10/685,226	Applicant(s)/Patent Under Reexamination VARDI ET AL.	
	Examiner Jaworski Francis J.	Art Unit 3768	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,254,112	10-1993	Slnofsky et al.	606/7
*	B	US-5,944,687	08-1999	Benett et al.	604/22
*	C	US-5,615,675	04-1997	O'Donnell et al.	600/425
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EXPEDITED PROCEDURE – EXAMINING GROUP 3737

S/N 10/685,226 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Gil M. Vardi et al.	Examiner: Ali Imam
Serial No.:	10/685,226	Group Art Unit: 3737
Filed:	October 14, 2003	Docket No.: 1599.003US2
Title:	OPTICAL-ACOUSTIC IMAGING DEVICE	

AMENDMENT & RESPONSE UNDER 37 C.F.R. 1.116

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In response to the Final Office Action dated January 13, 2006, please amend the application as follows:

IN THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) An imaging device to be introduced into a body for internally imaging a portion of the body, the device comprising:

an elongate member including proximal and distal ends; and

an acoustic-to-optical transducer located on the elongate member away from the proximal end of the elongate member, wherein the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use for introducing [[an]] a separate ancillary device into the body.

2. (Original) The device of claim 1, in which the elongate member includes at least one optical fiber.

3. (Original) The device of claim 2, in which the optical fiber includes a damped silica fiber.

4. (Original) The device of claim 1, in which the acoustic-to-optical transducer includes a Bragg grating sensor.

5. (Original) The device of claim 4, in which the elongate member includes at least one optical fiber, and in which the Bragg grating sensor is formed in a core of the optical fiber.

6. (Original) The device of claim 5, in which the Bragg grating includes a length, in a longitudinal direction of the elongate member, that is at least 200 times an optical wavelength of light passing through the core of the optical fiber.

7. (Original) The device of claim 4, in which the Bragg grating sensor includes a variable period.

8. (Original) The device of claim 7, further including a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period.

9. (Original) The device of claim 1, further comprising an electrical-to-acoustic transducer, at least a portion of the electrical-to-acoustic transducer located away from the proximal end of the elongate member.

10. (Original) The device of claim 9, in which the electrical-to-acoustic transducer includes a piezoelectric transducer.

11. (Original) The device of claim 10, in which the elongate member includes at least one optical fiber, and in which the piezoelectric transducer includes a circumferential jacket about at least a portion of the optical fiber.

12. (Original) The device of claim 9, further comprising an electrical driver, coupled to the electrical-to-acoustic transducer.

13. (Original) The device of claim 12, in which the electrical driver is operable to couple an approximately 40 megahertz electrical signal to the electrical-to-acoustic transducer.

14. (Original) The device of claim 1, in which the elongate member includes at least one aperture.

15. (Original) The device of claim 14, in which the at least one aperture has a length, in a longitudinal direction of the elongate member, of approximately between about 151 microns and about 200 microns.

16. (Original) The device of claim 14, in which the elongate member includes a plurality of apertures disposed in a spiral pattern along the elongate member.

17. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 1 millimeter.

18. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 0.5 millimeters.

19. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 0.2 millimeters.

20. (Cancelled)

21. (Original) The device of claim 1, in which the elongate member comprises at least one optical fiber, the fiber including a core and a cladding about at least a portion of the core.

22. (Original) The device of claim 21, in which a diameter of the cladding varies longitudinally along the elongate member.

23. (Original) The device of claim 22, in which the diameter of the cladding varies periodically.

24. (Original) The device of claim 22, in which the diameter of the cladding varies periodically with a period that is approximately equal to an acoustic wavelength in water.

25. (Original) The device of claim 22, in which the diameter of the cladding varies periodically with a period that is approximately equal to a quasi-Lamb wavelength in the optical fiber.

26. (Original) The device of claim 21, in which the cladding includes a plurality of beads separated from each other by filler regions of lower acoustic impedance than the beads.

27. (Original) The device of claim 26, in which the beads are substantially formed from silica.

28. (Original) The device of claim 26, in which the filler regions are substantially formed from at least one of a polymer, a gel, and a fluid.

29. (Previously Presented) The device of claim 21, further comprising a piezoelectric jacket about at least a portion of the optical fiber, at least a portion of the piezoelectric jacket operating as an electrical-to-acoustic transducer.

30. (Original) The device of claim 29, in which the piezoelectric jacket is substantially formed from polyvinyldiene fluoride (PVDF).

31. (Original) The device of claim 21, in which the jacket is shaped as a spiral about the optical fiber in a longitudinal direction of the elongate member.

32. (Original) The device of claim 29, in which the jacket includes a plurality of ribs.

33. (Original) The device of claim 29, further including:
a cylindrical strength member about at least a portion of the jacket; and
a cylindrical sheath about at least a portion of the cylindrical strength member.

34. (Previously Presented) The device of claim 1, in which the elongate member includes an acoustic signal collecting lens.

35. (Original) The device of claim 1, further including a laser operatively coupled to the elongate member.

36. (Original) The device of claim 1, further including an electrical generator operatively coupled to the elongate member.

37. (Currently Amended) A method comprising:

introducing an elongate imaging device into a body, wherein the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use for introducing [[an]] a separate ancillary device into the body;

delivering acoustic energy from a portion of the device that is located within the body;

receiving, within the body, acoustic energy reflected from the body;

transducing, within the body, the received acoustic energy into an optical signal; and

communicating the optical signal to a location outside of the body.

38. (Original) The method of claim 37, further comprising forming an image of a region within the body using the optical signal that was communicated to a location outside of the body.

39. (Previously Presented) The method of claim 37, comprising:

introducing a catheter over the elongate imaging device; and

guiding the catheter to a desired location using the elongate imaging device.

40. (Original) The method of claim 37, in which the transducing includes using a Bragg grating.

41. (Previously Presented) An imaging device for being introduced into a body for imaging an internal portion of the body, the device comprising:

an elongate member including proximal and distal ends; and

means, located on the elongate member, for performing acoustic-to-optical transducing using an acoustic-to-optical transducer located on the elongate member, in which the acoustic-to-optical transducer includes a user-selectable longitudinal location.

42. (Currently Amended) A device for imaging comprising:

a guidewire, the guidewire comprising;

an optical fiber;

a piezoelectric jacket; and

at least one Bragg grating sensor; and

wherein the optical fiber is at least partly coated with the piezoelectric jacket, and where the at least one Bragg grating is contained within the optical fiber, and wherein the profile of the device is less than 1 millimeter in diameter, and wherein the guidewire has sufficient rigidity to permit introducing [[an]] a separate ancillary device into the body using the guidewire.

43. (Original) The device of claim 42, further comprising a strength member, wherein the strength member includes at least one aperture.

44. (Original) The device of claim 42, wherein the device is an intravascular guidewire.

45. (Original) The device of claim 42, wherein the device is sized and shaped for being used for intravascular imaging in conjunction with catheterization.

46. (Original) The device of claim 42, wherein the device is sized and shaped for being used for intravascular imaging at least one of before, during, or after catheterization.

47. (Original) The device of claim 42, wherein the optical fiber comprises silicon oxide and the piezoelectric jacket comprises poled polyvinyldiene fluoride.

48. (Previously Presented) The device of claim 41, in which the acoustic-to-optical transducer includes a Bragg grating with a variable period.

49. (Previously Presented) The device of claim 48, further including a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to

adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period.

50. (Previously Presented) The device of claim 41, in which the elongate member has sufficiently small diameter and sufficient rigidity to permit introducing an ancillary device into the body using the elongate member.

51. (Previously Presented) The device of claim 50, in which the elongate member is an intravascular guidewire that is sized and shaped for being used for real-time intravascular imaging in conjunction with catheterization.

52. (Previously Presented) The device of claim 41, further comprising a strength member, wherein the strength member includes at least one aperture.

REMARKS

This responds to the Office Action dated on January 13, 2006. Claims 1, 37, and 42 are amended. No claims are cancelled or added. As a result, claims 1-19, 21-52 remain pending in this patent application.

This response incorporates by reference the remarks of Applicant's previous response, which was entered on October 17, 2005, and which are omitted here, for brevity.

Double Patenting Rejection

Claims 1-19 and 21-52 were rejected under the judicially created doctrine of double patenting over claims 1-16 of U.S. Patent No. 6,659,957. Applicant respectfully submits that because the claims have not been indicated to be otherwise allowable, it is premature to address the question of whether the present claims meet the requirements for a double patenting rejection. Accordingly, Applicant will consider whether to traverse or submit a terminal disclaimer to obviate this rejection when the claims are otherwise indicated to be allowable.

§102 Rejection of the Claims

Claims 1-19 and 21-52 were rejected under 35 U.S.C. § 102(b) for anticipation by Riza (U.S. 5,718,226). Applicant respectfully traverses.

Concerning claims 1-19, 21-40 and 42-52:

Applicant cannot find in the cited portions of Riza any disclosure of an elongate member that includes (1) a sufficiently small diameter and (2) sufficient rigidity, to permit use for introducing a "separate" ancillary device (such as a separate catheter) into the body, as presently similarly recited or incorporated in claims 1-19, 21-40 and 42-52. Applicant respectfully submits that the Office Action's interpretation of Riza's ultrasonic transmitter and receiver as the ancillary device does not constitute a "separate" ancillary device. Instead, Riza's transmitter and receiver appear to be part of the same elongate member (probe) and, therefore, cannot possibly constitute a separate ancillary device.

By contrast the above-cited claims presently recite or incorporate an elongate member that includes a sufficiently small diameter and sufficient rigidity to permit introducing a separate ancillary device (for example, a separate catheter) into the body. In such an embodiment, the claimed device is capable of producing real time images during vascular intervention procedures using an entirely separate catheter, such as before insertion of the separate catheter and throughout the separate catheterization procedure (*See* Application at page 4). Such images are useful for properly performing such procedures involving a separate catheter, which may provide additional interventional functionality.

Moreover, Applicant respectfully submits that the present claim amendments are fully supported by the present patent specification as filed, and do not introduce any new matter that could require any additional search or consideration. For example, certain previously pending claims (e.g., claim 42) already include the use of the term "guidewire," which Applicant respectfully submits would be understood by one of ordinary skill in the art as being capable of introducing a "separate" device, such as a separate catheter. Accordingly, Applicant respectfully submits that the amended claims are allowable over the art of record in their present form without raising any new issues that would require any further consideration.

Concerning claim 41 and 48-52:

Applicant cannot find in the cited portions of Riza any disclosure of an acoustic-to-optical transducer that includes "a user-selectable longitudinal location," as recited or incorporated in these claims.. For example, the present patent application explains how using a variable period Bragg grating sensor allows use of a tunable laser to select a particular desired portion of the Bragg grating sensor for imaging a corresponding nearby region of tissue or the like. (*See, e.g.,* Application at page 8). Because the cited portions of Riza apparently do not disclose all of the subject matter of claims 41 and 48-50, Applicant respectfully requests withdrawal of this basis of rejection for these claims.

Moreover, with respect to these remarks concerning claims 41 and 48-52, Applicant respectfully notes that these remarks were submitted in Applicant's previous response, however, the Final Office Action has not addressed such previously-submitted remarks. Accordingly, Applicant respectfully submits that Applicant's remarks have apparently not been fully considered, and Applicant respectfully requests withdrawal of the finality of the rejection of claims 41 and 48-52 to afford Applicant adequate opportunity to respond.

Reconsideration of Previous Response and of Finality of the Rejection

Applicant's previous response included certain remarks pointing out various patentably distinct individual features of various claims (*e.g.*, claims 3, 6, 7, 8, 9-13, 14-16, 22-28, 29-32, 33, 34, 36, 37-39, 41, and 48-50. However, the Final Office Action failed to respond to these remarks. The Final Office Action has not explained where such patentably distinct features are found in the relied-upon Riza reference. Therefore, there is presently no evidence of record to support a rejection of such claims. Moreover, Applicant respectfully submits that the because the examination of such claims has not considered and responded to such remarks, Applicant has been denied a full and fair opportunity to respond to the apparently arbitrary rejection of such claims. As such, Applicant respectfully submits that the rejection is inappropriate, and the finality of the present rejection is premature. Applicant respectfully requests withdrawal of the present rejection, withdrawal of the finality of the present rejection, full consideration of all remarks previously submitted in Applicant's previous response (such remarks are omitted here, for brevity), and that Applicant be given a full opportunity to respond to the same.

Request for Telephonic Interview

If all claims are not found to be allowable, Applicant respectfully requests the opportunity for a telephonic interview by Applicant's counsel, Suneel Arora, who can be reached at 612-373-6951.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6951 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

GIL M. VARDI ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6944

Date 3-13-06

By
David C. Peterson
Reg. No. 47,857

Date of Deposit: March 13, 2006
This paper or fee is being filed on the date indicated above using the USPTO's electronic filing system EFS-Web, and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Gil M. Vardi et al.	Examiner: Ali Imam
Serial No.:	10/685,226	Group Art Unit: 3737
Filed:	October 14, 2003	Docket No.: 1599.003US2
Title:	OPTICAL-ACOUSTIC IMAGING DEVICE	

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

This responds to the Office Action mailed on June 15, 2005. Please amend the above-identified patent application as follows.

This response is accompanied by a Petition, as well as the appropriate fee, to obtain a one-month extension of the period for responding to the Office Action, thereby moving the deadline for response from September 15, 2005 to October 15, 2005.

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An imaging device to be introduced into a body for internally imaging a portion of the body, the device comprising:

an elongate member including proximal and distal ends; and

an acoustic-to-optical transducer located on the elongate member away from the proximal end of the elongate member, wherein the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use for introducing an ancillary device into the body.

2. (Original) The device of claim 1, in which the elongate member includes at least one optical fiber.

3. (Original) The device of claim 2, in which the optical fiber includes a damped silica fiber.

4. (Original) The device of claim 1, in which the acoustic-to-optical transducer includes a Bragg grating sensor.

5. (Original) The device of claim 4, in which the elongate member includes at least one optical fiber, and in which the Bragg grating sensor is formed in a core of the optical fiber.

6. (Original) The device of claim 5, in which the Bragg grating includes a length, in a longitudinal direction of the elongate member, that is at least 200 times an optical wavelength of light passing through the core of the optical fiber.

7. (Original) The device of claim 4, in which the Bragg grating sensor includes a variable period.

8. (Original) The device of claim 7, further including a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period.

9. (Original) The device of claim 1, further comprising an electrical-to-acoustic transducer, at least a portion of the electrical-to-acoustic transducer located away from the proximal end of the elongate member.

10. (Original) The device of claim 9, in which the electrical-to-acoustic transducer includes a piezoelectric transducer.

11. (Original) The device of claim 10, in which the elongate member includes at least one optical fiber, and in which the piezoelectric transducer includes a circumferential jacket about at least a portion of the optical fiber.

12. (Original) The device of claim 9, further comprising an electrical driver, coupled to the electrical-to-acoustic transducer.

13. (Original) The device of claim 12, in which the electrical driver is operable to couple an approximately 40 megahertz electrical signal to the electrical-to-acoustic transducer.

14. (Original) The device of claim 1, in which the elongate member includes at least one aperture.

15. (Original) The device of claim 14, in which the at least one aperture has a length, in a longitudinal direction of the elongate member, of approximately between about 151 microns and about 200 microns.

16. (Original) The device of claim 14, in which the elongate member includes a plurality of apertures disposed in a spiral pattern along the elongate member.

17. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 1 millimeter.

18. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 0.5 millimeters.

19. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 0.2 millimeters.

20. (Cancelled) The device of claim 1, in which the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use as a guidewire permitting a catheter to be introduced over the guidewire into vasculature of the body.

21. (Original) The device of claim 1, in which the elongate member comprises at least one optical fiber, the fiber including a core and a cladding about at least a portion of the core.

22. (Original) The device of claim 21, in which a diameter of the cladding varies longitudinally along the elongate member.

23. (Original) The device of claim 22, in which the diameter of the cladding varies periodically.

24. (Original) The device of claim 22, in which the diameter of the cladding varies periodically with a period that is approximately equal to an acoustic wavelength in water.

25. (Original) The device of claim 22, in which the diameter of the cladding varies periodically with a period that is approximately equal to a quasi-Lamb wavelength in the optical fiber.

26. (Original) The device of claim 21, in which the cladding includes a plurality of beads separated from each other by filler regions of lower acoustic impedance than the beads.

27. (Original) The device of claim 26, in which the beads are substantially formed from silica.

28. (Original) The device of claim 26, in which the filler regions are substantially formed from at least one of a polymer, a gel, and a fluid.

29. (Currently Amended) The device of claim 21, further comprising a piezoelectric jacket about at least a portion of the optical fiber, at least a portion of the piezoelectric jacket operating as an electrical-to-acoustic transducer.

30. (Original) The device of claim 29, in which the piezoelectric jacket is substantially formed from polyvinyldiene fluoride (PVDF).

31. (Original) The device of claim 21, in which the jacket is shaped as a spiral about the optical fiber in a longitudinal direction of the elongate member.

32. (Original) The device of claim 29, in which the jacket includes a plurality of ribs.

33. (Original) The device of claim 29, further including:
a cylindrical strength member about at least a portion of the jacket; and
a cylindrical sheath about at least a portion of the cylindrical strength member.

34. (Currently Amended) The device of claim 1, in which the elongate member includes [[a]] an acoustic signal collecting lens.

35. (Original) The device of claim 1, further including a laser operatively coupled to the elongate member.

36. (Original) The device of claim 1, further including an electrical generator operatively coupled to the elongate member.

37. (Currently Amended) A method comprising:

introducing an elongate imaging device into a body, wherein the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use for introducing an ancillary device into the body;
delivering acoustic energy from a portion of the device that is located within the body;
receiving, within the body, acoustic energy reflected from the body;
transducing, within the body, the received acoustic energy into an optical signal; and
communicating the optical signal to a location outside of the body.

38. (Original) The method of claim 37, further comprising forming an image of a region within the body using the optical signal that was communicated to a location outside of the body.

39. (Currently Amended) The method of claim 37, ~~in which the delivering acoustic energy comprises delivering ultrasound energy~~ comprising:

introducing a catheter over the elongate imaging device; and
guiding the catheter to a desired location using the elongate imaging device.

40. (Original) The method of claim 37, in which the transducing includes using a Bragg grating.

41. (Currently Amended) An imaging device for being introduced into a body for imaging an internal portion of the body, the device comprising:

an elongate member including proximal and distal ends; and

means, located on the elongate member, for performing acoustic-to-optical transducing using an acoustic-to-optical transducer located on the elongate member, in which the acoustic-to-optical transducer includes a user-selectable longitudinal location.

42. (Currently Amended) A device for imaging comprising:

a guidewire, the guidewire comprising;

an optical fiber;

a piezoelectric jacket; and

at least one Bragg grating sensor; and

wherein the optical fiber ~~is located around the guidewire and~~ is at least partly coated with the piezoelectric jacket, and where the at least one Bragg grating is contained within the optical fiber, and wherein the profile of the device is less than ~~100 mm~~ 1 millimeter in diameter, and wherein the guidewire has sufficient rigidity to permit introducing an ancillary device into the body using the guidewire.

43. (Original) The device of claim 42, further comprising a strength member, wherein the strength member includes at least one aperture.

44. (Original) The device of claim 42, wherein the device is an intravascular guidewire.

45. (Original) The device of claim 42, wherein the device is sized and shaped for being used for intravascular imaging in conjunction with catheterization.

46. (Original) The device of claim 42, wherein the device is sized and shaped for being used for intravascular imaging at least one of before, during, or after catheterization.

47. (Original) The device of claim 42, wherein the optical fiber comprises silicon oxide and the piezoelectric jacket comprises poled polyvinyldiene fluoride.

48. (New) The device of claim 41, in which the acoustic-to-optical transducer includes a Bragg grating with a variable period.

49. (New) The device of claim 48, further including a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period.

50. (New) The device of claim 41, in which the elongate member has sufficiently small diameter and sufficient rigidity to permit introducing an ancillary device into the body using the elongate member.

51. (New) The device of claim 50, in which the elongate member is an intravascular guidewire that is sized and shaped for being used for real-time intravascular imaging in conjunction with catheterization.

52. (New) The device of claim 41, further comprising a strength member, wherein the strength member includes at least one aperture.

REMARKS

This responds to the Office Action mailed on June 15, 2005.

Claims 1, 29, 34, 37, 39, 41-42 are amended. Claim 20 is canceled. Claims 48-52 are added. As a result, claims 1-19, 21-52 are now pending in this application.

Double Patenting Rejection

Claims 1-47 were rejected under the judicially created doctrine of double patenting over claims 1-16 of U.S. Patent No. 6,659,957 B1. Applicant respectfully requests that this rejection be held in abeyance until the claims are otherwise indicated to be allowable. Applicant will consider submitting a terminal disclaimer, if appropriate, when the claims are otherwise indicated to be allowable.

§102 Rejection of the Claims

Claims 1-47 were rejected under 35 U.S.C. § 102(b) for anticipation by Riza (US 5,718,226). Applicant respectfully traverses.

Concerning Claims 1-40:

Applicant cannot find in the cited portions of Riza any disclosure of an imaging device to be introduced into a body for internally imaging a portion of the body, the device comprising an elongate member that includes a sufficiently small diameter and sufficient rigidity to permit introducing an ancillary device (for example, a catheter) into the body, as presently recited or incorporated in these claims. In such an embodiment, the claimed device is capable of producing real time images during vascular intervention procedures, such as before catheter insertion and throughout the catheterization procedure (*See* Application at page 4). Such images are useful for properly performing such catheterization procedures. In sum, because the cited portions of Riza apparently do not disclose all elements recited or incorporated in claims 1-40, Applicant respectfully requests the withdrawal of this basis of rejection of these claims.

Also, concerning claim 3, Applicant cannot find in the cited portions of Riza any disclosure of a "damped silica fiber," as expressly recited in this claim. For example, the present patent application explains how using a damped silica fiber expands the frequency bandwidth of the signal, which improves the resolution of the received signal. (*See* Application at page 7.)

Because Riza does not disclose all of the claimed subject matter of claim 3, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Moreover, concerning claim 6, Applicant cannot find in the cited portions of Riza any disclosure of a Bragg grating that "includes a length, in a longitudinal direction of the elongate member, that is at least 200 times an optical wavelength of light passing through the core of the optical fiber," as expressly recited in claim 6. For example, the present patent application explains how using a Bragg grating of some hundreds of optical wavelengths will provide considerably enhanced reflection of the optical beam used. Because Riza does not disclose all of the claimed subject matter of claim 6, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Furthermore, concerning claim 7, Applicant cannot find in the cited portions of Riza any disclosure of a Bragg grating sensor that includes a variable period, as expressly recited in claim 7. For example, the present patent application explains how using a variable period Bragg grating sensor allows use of a tunable laser to select a particular desired portion of the Bragg grating sensor for imaging a corresponding nearby region of tissue or the like. Because Riza does not disclose all of the claimed subject matter of claim 7, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Further, concerning claim 8, Applicant cannot find in the cited portions of Riza any disclosure of "a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period," as expressly recited in claim 8. For example, the present patent application explains how using a Bragg grating sensor allows use of a tunable laser to select a particular desired portion of the Bragg grating sensor for imaging a corresponding nearby region of tissue or the like. Because Riza does not disclose all of the claimed subject matter of claim 8, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Still further, concerning claims 9-13, Applicant cannot find in the cited portions of Riza any disclosure of "an electrical-to-acoustic transducer, at least a portion of the transducer located away from the proximal end of the elongate member," as expressly recited or incorporated in claims 9-13. Instead, Riza apparently only discloses using light to produce optical pulses to generate ultrasonic signals (Riza at col. 5, lines 26-32). Moreover, Riza apparently teaches away from use of an electrical-to-acoustic transducer by emphasizing potential hazards of using electrical cable in a patient (*See* Riza at col. 3, lines 36-40). Because Riza does not disclose all of the claimed subject matter of claims 9-10 and teaches away from the subject matter of claim 9-13, Applicant respectfully requests withdrawal of this basis of rejection of these claims.

Also, concerning claims 14-16, Applicant cannot find in the cited portions of Riza any disclosure of an elongate member that includes at least one aperture, as expressly recited in claims 14-16. For example, pages 8-9 of the present patent application describes distributed apertures in an optional strength member, which, among other things, provides sufficient rigidity to permit use as a real-time imaging guidewire during catheterization. Because Riza does not disclose all of the subject matter of claims 14-16, Applicant respectfully requests withdrawal of this basis of rejection these claims.

Moreover, concerning claims 22-28, Applicant cannot find in the cited portions of Riza any disclosure of a longitudinally variable diameter cladding, as expressly recited or incorporated in these claims. For example, the present patent application explains that such variation, which can be achieved by the use of beads 21 as shown in FIG. 10, causes an increased sensitivity to acoustic waves, which maximum efficiency achieved with a period equal to one of at least two resonance lengths. Because Riza apparently does not disclose all of the subject matter of claims 22-28, Applicant respectfully requests withdrawal of this basis of rejection these claims.

Further, concerning claims 29-32, Applicant cannot find in the cited portions of Riza any disclosure of using a piezoelectric jacket operating as an electrical-to-acoustic transducer (claim 29), a substantially PVDF jacket (claim 30), a spiral jacket (claim 31), or a ribbed jacket (claim 32). As discussed above with respect to claims 9-13, Riza apparently uses an optical-to-acoustic transducer instead of an electrical-to-acoustic transducer. Moreover, the present patent application explains how a spiral or ribbed jacket increases acoustic-to-optical sensitivity. Because Riza apparently does not disclose all of the subject matter of claims 29-32, Applicant respectfully requests withdrawal of this basis of rejection of these claims.

Furthermore, concerning claim 33, Applicant cannot find in the cited portions of Riza any disclosure of "a cylindrical strength member about at least a portion of the jacket; and a cylindrical sheath about at least a portion of the cylindrical strength member," as expressly recited in claim 33. In certain embodiments, such a strength member helps provide enough rigidity to permit the imaging guidewire to be used for guiding a catheter to a desired location while providing real-time images of the catheterization procedure, as discussed above. Because the cited portions of Riza do not disclose all of the subject matter of claim 33, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Still further, concerning claim 34, Applicant cannot find in the cited portions of Riza any disclosure of using an ultrasonic signal collecting lens, as presently expressly recited in this claim. (*See also, e.g.,* Application at pages 10-11.) Because the cited portions of Riza apparently do not disclose all of the subject matter of claim 34, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Also, concerning claim 36, Applicant cannot find in the cited portions of Riza any disclosure of "an electrical generator operatively coupled to the elongate member," as expressly recited in claim 36. As discussed above with respect to claims 9-13 and 29-32, Riza uses an optical-to-acoustic transducer and apparently teaches away from use of an electrical-to-acoustic transducer. Therefore, Riza would not include an electrical generator to create the ultrasound. Because the cited portions of Riza apparently do not disclose all of the subject matter of claim 36, Applicant respectfully requests withdrawal of this basis of rejection of this claim.

Moreover, concerning claims 37-39, Applicant cannot find in the cited portions of Riza any disclosure of introducing into a body an elongate imaging device that includes a sufficiently small diameter and sufficient rigidity to permit use for introducing an ancillary device into the body, as expressly recited or incorporated into these claims. Because the cited portions of Riza apparently do not disclose all of the subject matter of claims 37-39, Applicant respectfully requests withdrawal of this basis of rejection of these claims.

Concerning Claims 41, 48-50:

Applicant cannot find in the cited portions of Riza any disclosure of an imaging device for being introduced into a body for imaging an internal portion of the body, the device comprising: an elongate member including proximal and distal ends; and means, located on the elongate member, for performing acoustic-to-optical transducing using an acoustic-to-optical transducer located on the elongate member, in which the acoustic-to-optical transducer includes a user-selectable longitudinal location," as presently recited or incorporated in claims 41 and 48-50. For example, the present patent application explains how using a variable period Bragg grating sensor allows use of a tunable laser to select a particular desired portion of the Bragg grating sensor for imaging a corresponding nearby region of tissue or the like. (*See, e.g.*, Application at page 8). Because the cited portions of Riza apparently do not disclose all of the subject matter of claims 41 and 48-50, Applicant respectfully requests withdrawal of this basis of rejection for these claims.

Concerning Claims 42-47:

As an initial note, with respect to the Office Action's assertion that the "specific limitations of the guidewire and dimensions of the elongated probe are well known in the art [of] imaging device[s]," Applicant respectfully traverses this assertion. To the extent that these contentions in the Office Action are based on the Examiner's personal knowledge, Applicant timely objects to such reliance on Official Notice and respectfully requests that the Examiner provide a reference in support of such assertions as required by MPEP § 2144.03.

In response to the rejection, Applicant cannot find in the cited portions of Riza any disclosure of an imaging guidewire having a profile of less than 1 millimeter in diameter (amended to correct a typographical error; *see, e.g.*, Application at page 4, lines 7-9) and having sufficient rigidity to permit introducing an ancillary device into the body using the guidewire, as recited or incorporated in these claims. In certain embodiments, this permits the imaging guidewire to be used for guiding a catheter to a desired location while providing real-time images of the catheterization procedure. With respect to such an embodiment, the present patent specification explains:

> The imaging guidewire of the invention can function as the guidewire for vascular interventions, and [] enables real time imaging during balloon inflation and stent deployment, thus will provide clinical information that is not available when catheter-based imaging systems are used. The device of the invention may enable shortened total procedure times, including fluoroscopy time, and will also reduce radiation exposure to the patient and the operator.

(Application at page 3, line 25 page 4, line 6.) Because Riza apparently fails to disclose all of the subject matter of these claims, Applicant respectfully requests withdrawal of this basis of rejection of these claims.

New Claims

New claims 48 – 52 have been added to more particularly point out and distinctly claim aspects of the present subject matter. Applicant believes such dependent claims to be patentable for the reasons stated above with respect to their base claim 41, as well as for the language included in such dependent claims. Accordingly, Applicant respectfully requests allowance of new claims 48 – 52.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6951 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

GIL M. VARDI ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6951

Date October 14, 2005 By

Suneel Arora
Reg. No. 42,267

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 14 day of October, 2005.

LISA POSORSKE — Lisa Posorske

Name — Signature